

IN THE CLAIMS:

Please cancel claims 1-39 and replace them with new claims 40-76:

1. (Canceled).
2. (Canceled).
3. (Canceled).
4. (Canceled).
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39. (Canceled).

40. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting a bud of said plant substantially continuously over a period of at least 1 day with an effective amount of a composition comprising from about 0.5% w/v colchicine to about 3% w/v colchicine, wherein said bud comprises actively dividing cells and is apically or terminally dominant; and

exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.

41. (New). The method of claim 40, wherein said bud is a bud that has been grafted onto a rootstock plant.

42. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting a bud of said plant substantially continuously over a period of at least 1 day with an effective amount of a composition comprising from about 0.5% w/v

colchicine to about 3% w/v colchicine, wherein said bud has been grafted onto a rootstock plant, comprises actively dividing cells and is apically or terminally dominant.

43. (New). The method of claim 42, further comprising the step of exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.

44. (New). The method of claims 41 or 42 wherein the apical shoot and all buds of the rootstock plant have been removed.

45. (New). The method of claims 40 or 42, wherein said bud is the sole bud on said plant.

46. (New). The method of claims 40 or 42 wherein the concentration of colchicine is about 1% w/v.

47. (New). The method of claims 40 or 42 wherein the plant is selected from the group consisting of a *Prunus* spp, *Pyrus* spp, *Malus* spp, *Citrus* spp, *Poncirus* spp, *Persea* spp, *Mangifera* spp, *Punica* spp, and *Olea* spp.

48. (New). The method of claims 40 or 42 wherein the method further comprises prior to said contacting step exposing said plant tissue to conditions sufficient to break dormancy of said bud.

49. (New). The method of claim 48 wherein conditions sufficient to break dormancy of said bud comprise maintaining said bud at an appropriate temperature for a time sufficient to satisfy the chill requirement of said bud, optionally in the presence of hydrogen cyanimide, and maintaining said bud at an appropriate temperature for a time sufficient to prime cell division in said bud.

50. (New). The method of claims 40 or 42 wherein said contacting comprises at least partially enveloping said bud with an absorbent material.

51. (New). The method of claims 40 or 42 wherein said bud, and surrounding tissue, is at least partially enveloped with a material capable of inhibiting gaseous exchange.

52. (New). The method of claims 40 or 42 wherein said contacting comprises substantially continuous exposure of said tissue to said composition over a period from about one day to about 30 days.

53. (New). The method of claims 40 or 42 wherein said contacting comprises substantially continuous exposure of said tissue to said composition over a period of about 10 days.

54. (New). The method of claims 40 or 42 wherein said contacting comprises multiple applications of said composition.

55. (New). The method of claim 54 wherein said multiple applications comprise two or more applications per day.

56. (New). The method of claim 54 wherein at least one of said applications is administered when plant cell division is substantially maximal.

57. (New). The method of claims 40 or 42 wherein said bud is exposed to ultraviolet, or fluorescent light or a mercury and/or sodium lamp.

58. (New). The method of claim 57, wherein said plant tissue is exposed to ultraviolet, or fluorescent light or to a mercury and/or sodium lamp prior to said contacting as well as substantially continuously subsequent to said contacting at least until growth from the treated tissue occurs.

59. (New). The method of claims 40 or 42, wherein plant tissue arising from the treated bud, or cells at the base of the bud are checked for ploidy, tissue having the desired ploidy level selected, and the plants grown from the selected tissue is/are tested for inheritability of the desired ploidy level.

60. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting at least one apically or terminally dominant bud of said plant, wherein said bud comprises actively dividing cells, with a composition comprising about 0.5% w/v colchicine to about 3% w/v colchicine,

at least partially enveloping said bud with a material capable of inhibiting gaseous exchange, wherein said contacting is substantially continuous over a period of from about 5 days to about 15 days; and

exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.

61. (New). The method of claim 60, wherein said bud has been grafted onto a rootstock plant.

62. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting at least one bud of said plant with a composition comprising about 0.5% w/v colchicine to about 3% w/v colchicine, wherein said bud has been grafted onto a rootstock plant, is apically or terminally dominant and comprises actively dividing cells; and

at least partially enveloping said bud with a material capable of inhibiting gaseous exchange, wherein said contacting is substantially continuous over a period of from about 5 days to about 15 days.

63. (New). The method of claim 62, further comprising the step of exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.

64. (New). The method of claims 60 or 62, wherein said bud is the sole bud on said rootstock plant.

65. (New). The method of claims 60 or 62 wherein the concentration of colchicine is about 1% w/v.

66. (New). The method of claims 60 or 62 wherein the plant is selected from the group consisting of *Prunus* spp. *Pyrus* spp, and *Malus* spp.

67. (New). The method of claims 60 or 62 wherein the method further comprises prior to said contacting step exposing said plant tissue to conditions sufficient to break dormancy of said bud.

68. (New). The method of claims 60 or 62, further comprising the steps of:  
generating at least one plant from a bud so contacted; and  
selecting at least one plant having a desired ploidy level.

69. (New). The method according to claim 68 wherein the desired ploidy level is diploid (2N), tetraploid (4N) or hexaploid (6N), octoploid (8N), decaploid (10N) or dodecaploid (12N).

70. (New). A method of generating a woody perennial plant having at least one desired trait, the method comprising:

generating tetraploid plant tissue from a bud of a diploid parental woody perennial plant variety by a method of any one of claims 40, 42, 60 or 62;

generating at least one tetraploid plant from said tetraploid tissue;

crossing said tetraploid plant with a diploid plant;

generating at least one progeny plant having the desired trait.

71. (New). The method of claim 70 wherein the desired trait is seedlessness.

72. (New). The method of claim 70 wherein said tetraploid plant is back-crossed with said diploid parental woody perennial plant variety.

73. (New). The method of claims 40, 42, 60, or 62, wherein said contacting commences substantially coincidental with breaking dormancy of said bud.

74. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting a bud of said plant substantially continuously over a period of at least 1 day with an effective amount of a composition comprising an agent capable of inhibiting spindle formation, wherein said contacting commences substantially coincidental with breaking dormancy of said plant tissue, wherein said bud comprises actively dividing cells and is apically or terminally dominant; and

exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.

75. (New). A method of increasing ploidy in cells of a woody perennial plant, the method comprising:

contacting a bud of said plant substantially continuously over a period of at least 1 day with an effective amount of a composition comprising an agent capable of inhibiting spindle formation, wherein said contacting commences substantially coincidental with breaking dormancy of said plant tissue, wherein said bud is grafted onto a rootstock plant, comprises actively dividing cells and is apically or terminally dominant.

76. (New). The method of claim 75, further comprising the step of exposing the treated bud to substantially constant illumination until growth from the treated tissue occurs.